

3/10/05

//insert page 1 of Patent Cooperation Treaty form//

//insert item 1 of Preliminary Patentability Report form//

2. With respect to the **Sections*** of the International Application, the report is based on (replacement pages that were submitted with the application department upon a request according to Article 14 are treated as "originally submitted" pages in this report and therefore not enclosed):

Description, Pages

1, 2, 4-13	in the originally submitted version
3	received on April 21, 2005 with a
letter	dated April 20, 2005

Claims, No.

1-12	received on April 21, 2005 with a
letter	dated April 20, 2005

Figures, Sheets

1/3-3/3	in the originally submitted version
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☐ A sequence protocol and/or any corresponding tables--see supplementary section pertaining to the sequence protocol.

//insert items 3. and 4. of Preliminary
Patentability Report form//

* If item 4 applies, a remark "replaced" may be placed on a few or all of these pages.

Preliminary International Patentability Report

International Filing No.: PCT/DE2004/000693

Item number V. Substantiated determination according to Article 35 (2) regarding novelty, inventive activity and commercial applicability; documents and declarations for supporting this determination

1. Determination

Novelty (N)	Yes: Claims 1-12
	No: Claims

Inventive activity (IS)	Yes: Claims 1-12
	No: Claims

Commercial applicability (IA)	Yes: Claims 1-12
	No: Claims

2. Documents and Declarations (Regulation 70.7):

See supplementary sheet

**Preliminary International Patentability Report
(Supplementary Page)**

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Document DE 42 10 816 presumably represents the state of the art most closely related to the object of Claim 1. This document discloses (the references in parentheses apply to this document) a soil cultivation appliance with an asynchronous rotary current motor for driving a rotatable cultivating tool.

This known appliance has the significant disadvantage that it is very difficult to handle and requires a substantial expenditure of physical force by the user when it is used for cultivating soil of uneven consistency.

This deficiency is eliminated with the characteristics disclosed in the characterizing portion of Claim 1. According to the invention, a frequency converter with manually adjustable frequency is provided for controlling the rotary current motor. The rotary current motor also has a large number of turn grooves and poles in order to maintain a sufficiently high torque in the lower speed range.

According to PCT Article 33 (2), this additional development or embodiment of the appliance drive is new in comparison with DE 42 10 816 because this citation does not provide any information on the control of the rotary current motor. The remark that the motor can be switched in such a way that the tools revolve at half speed implies that the motor consists of a pole-changing motor. Other

than that, this publication does not provide any information on the motor control.

Publication DE 1 298 743 pertains to a potentiometer with a pick-off that is driven by a motor controlled by a frequency converter. This device cannot be compared with the present invention because the functional configuration of the main components potentiometer, motor and frequency converter fundamentally differs from that of the present invention. The soil cultivation appliance according to Figure 1 cannot be anticipated by combining documents DE 42 10 816 and DE 1 298 743 and therefore is considered to be inventive in the sense of PCT Article 33 (3).

Since Claims 2-12 pertain to preferred embodiments of the claimed object and are dependent on Claim 1, they also fulfill the requirements of PCT Articles 33 (2) and 33 (3).

The commercial applicability in the sense of Article 33 (4), PCT, is apparent.

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Description of the Invention

This objective is attained with the soil cultivation appliance according to Claim 1. Advantageous variations and additional developments of the soil cultivation appliance form the objects of the dependent claims or can be inferred from the following description and the embodiments.

The hand-operated electromotive soil cultivation appliance according to the invention comprises an asynchronous rotary current motor for driving a rotatable cultivating tool. The soil cultivation appliance comprises a frequency converter for generating a drive voltage of adjustable frequency for the rotary current motor, wherein the frequency converter is connected to a manually operated adjusting device for varying the frequency of the drive voltage. Due to the suitably chosen number of poles and turns, the rotary current motor is realized in such a way that a nearly constant torque of the rotary current motor is maintained over a broad range of motor speeds that can be adjusted by means of the adjusting device. In this case, a correspondingly large number of turn grooves and/or poles is provided in order to ensure that a sufficiently high torque is also maintained at lower speeds. The broad speed range preferably covers speeds between 20 and more than 2000 rpm, particularly up to approximately 6500 rpm. An even more advantageous speed range of the rotary current motor covers speeds between 10 and more than 3000 rpm.

An approximately constant torque over a broad speed range can be ensured by suitably adapting the number of poles on one hand and the number of turns of the stator of the rotary current motor on the other hand.